EX 29 : $a=\frac{\sqrt{3}+1}{4}+i\frac{\sqrt{3}-1}{4}$ $z_0=6+6i$ $A_0(z_0)$ $z_n=a^n.z_0$ $A_n(z_n)$

1) $z_1=a.z_0=6(1+i)\left[\frac{\sqrt{3}+1}{4}+i\frac{\sqrt{3}-1}{4}\right]=3+3i\sqrt{3}\Rightarrow \boxed{z_1=3+3i\sqrt{3}}$

$a^2=\left(\frac{\sqrt{3}+1}{4}\right)^2-\left(\frac{\sqrt{3}-1}{4}\right)^2+2i\frac{(\sqrt{3}+1)(\sqrt{3}-1)}{16}=\frac{(4+2\sqrt{3})-(4-2\sqrt{3})+4i}{16}\Rightarrow \boxed{a^2=\frac{\sqrt{3}-i}{4}}$

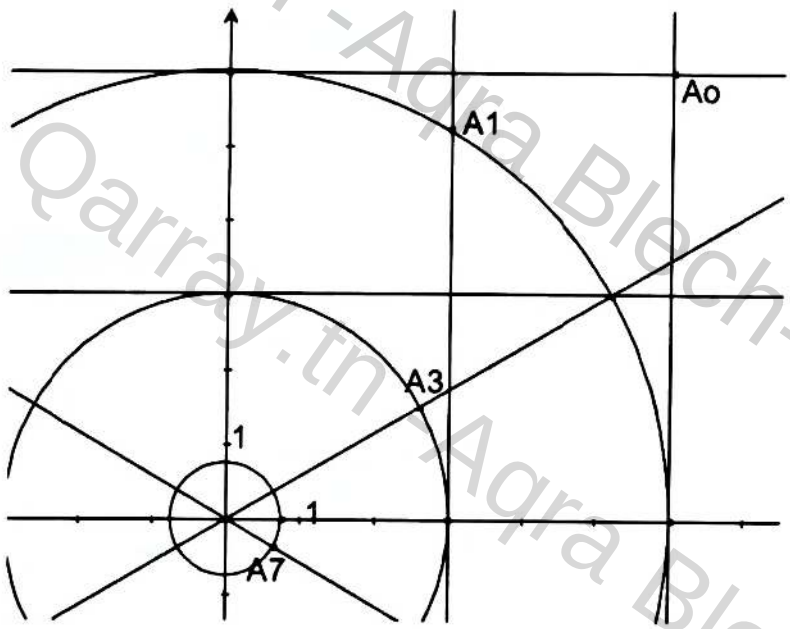
• $z_1=6\left(\frac{1}{2}+i\frac{\sqrt{3}}{2}\right)=6e^{i\frac{\pi}{3}}$ et $a^2=\frac{1}{2}\left(\frac{\sqrt{3}}{2}-\frac{1}{2}i\right)=\frac{1}{2}e^{-i\frac{\pi}{6}}$

$z_3=a^3.z_0=a^2.(a.z_0)\Rightarrow \boxed{z_3=a^2.z_1}\Rightarrow z_3=\frac{1}{2}e^{-i\frac{\pi}{6}}.6.e^{i\frac{\pi}{3}}\Rightarrow \boxed{z_3=3e^{i\frac{\pi}{6}}}$

2) et 3)

$z_7=a^7.z_0=\boxed{\left(a^2\right)^3.z_1}\Rightarrow z_7=\left(\frac{1}{2}e^{-i\frac{\pi}{6}}\right)^3.6e^{i\frac{\pi}{3}}=\frac{6}{8}e^{-i\frac{\pi}{2}}.e^{i\frac{\pi}{3}}\Rightarrow \boxed{z_7=\frac{3}{4}e^{-i\frac{\pi}{6}}}$

4) $z_{A_0}=z_0=6+6i$ $z_{A_1}=z_1=6e^{i\frac{\pi}{3}}$ $z_{A_3}=3e^{i\frac{\pi}{6}}$ $z_{A_7}=\frac{3}{4}e^{-i\frac{\pi}{6}}$



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